ABSTRACT

RESEARCH PAPER: Sex Differences in Vascular Hemodynamics in Middle-Age and Older Adults
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Cardiovascular disease-related (CVD) mortality with older age is in part attributable to altered vascular hemodynamics including increased central and peripheral blood pressure (BP) and augmentation index (AIx). Cardiorespiratory fitness (CRF) is inversely associated with CVD mortality independent of traditional risk factors. It is unknown, if vascular hemodynamics differ by sex. PURPOSE: To investigate sex differences in vascular hemodynamics in an apparently healthy middle-aged and older adult population. METHODS: Apparently healthy males and females (N=134; 63 M, 71 F; Age: 60.3 ± 10.3) from the Ball State Adult Fitness Longitudinal Lifestyle Study (BALL ST) were studied. All participants underwent assessment of vascular hemodynamics, which included non-invasive central and peripheral BP, central and peripheral pulse pressure (systolic minus diastolic BP), AIx (%), AIx normalized to HR 75 (AIx% HR75) and directly measured CRF (VO_{2max} ; ml/kg/min). Age and sex-adjusted CRF percentiles were calculated based on the Fitness Registry and Importance of Exercise National Database (FRIEND). Data was analyzed using t-test to determine significance. RESULTS: Compared to females, males had both higher brachial systolic blood pressure and central systolic blood pressure as well as in carotid-femoral Pulse Wave Velocity (all, $p<0.05$). Females had lower brachial systolic blood pressure ($p = 0.01$), brachial pulse pressure ($p = 0.02$), central systolic blood pressure ($p = 0.05$) and carotid-femoral Pulse Wave Velocity ($p = 0.01$).

CONCULSION: Our findings demonstrate sex-related differences in vascular hemodynamics in middle aged and older adults. These data support the notion of sex-related differences in vascular hemodynamics, in apparently healthy individuals.